

To the Drawings:

The drawings have been objected to under 37 C.F.R. 1.83(a) for failing to show every feature of the invention specified in the claims. Specifically, the unraveling of the drag means attached to a flat pin, as set forth in Claim 10, is not shown.

Accordingly, FIG. 2A has been amended to add ribbon 87. Support for this amendment can be found on page 10, line 7, and at page 18, line 25. The nylon ribbon 87 is an embodiment of “drag means attached to a flat pin” as set forth in Claim 10. In accordance with 37 C.F.R. 1.121(d), a replacement drawing sheet is being submitted with this response showing the amended FIG. 2A. No new matter has been added.

REMARKS

The present application was originally filed with Claims 1-13. Claim 13 has been cancelled in this reply, leaving Claims 1-12 pending and at issue. Of the remaining claims, Claims 1, 4-7 and 12 have been amended, as discussed in detail below.

The current PTO Action has objected to several informal matters of the present application. These objections are discussed in detail in the following section. The Action has also rejected Claims 1-13 under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. Claims 4-11 have been rejected under 35 U.S.C. 112, second paragraph, as indefinite. Substantively, Claims 1, 2 and 4-6 stand rejected under 35 U.S.C. 102(b) and Claims 1, 3, 7, 8/1-2, 4-6, 9, 10 and 11/1-2, 4-6 stand rejected under 35 U.S.C. 103(a). Applicants respectfully traverse the rejections and request reconsideration of all claims in light of the amendments above and arguments set forth below.

Objections:

Claim 1 has been amended to correct the word “prevention” so that it now reads “prevent” as intended. The error was inadvertent.

The drawing of FIG. 2A has been amended to add a nylon ribbon 87 (i.e., “drag means”) as described in the drawing amendment section, *supra*, and shown on the appended “Replacement Sheet.” Additionally, the reference number “87” has been added to the specification on pages 10 and 18.

Claim 12 has been amended to depend only from Claim 1, removing the improper multiple dependency.

Further, several paragraphs of the specification have been amended to correct inadvertent errors. For example, the words “cannon” and “ordnance” were misspelled, the term “charge” was corrected to read “warhead”, and the “time delay detonator ignition system” was occasionally referred to as a “mechanism.” These and other typographical errors were corrected for accuracy and readability. No new matter has been added.

Applicants believe that all the objections have been overcome in this response. Reconsideration and withdrawal of the same is respectfully requested.

112 Rejections:

The current Action states that the limitation “spin of submunition grenade applies centrifugal force on the firing pin,” as set forth in Claim 1, is not enabled. The Action notes “centrifugal force acts outwardly from the fuse, in a plane perpendicular to the firing pin.”

With reference to the “Background” (p. 2, lines 27-28), “Summary” (p. 6, lines 21-23) and “Detailed Description” (p. 10, lines 5-8) of the present application, Applicants contend the limitation is enabled.

When the submunitions are ejected from a cargo projectile, a drag means (e.g., the nylon ribbon 87) is dispensed and unfurls to cause drag on the firing pin relative to the submunition. As the submunition spins, as it must, the drag means slows the spinning of the firing pin, relative to the submunition, thus unscrewing the firing pin. Since the firing pin is disposed coaxially to the submunition, the movement of interest is longitudinal—i.e., in line with the axis X-X shown in Fig. 1. This feature is well-known by those skilled in the art and is even described in U.S. Patent No. 4,811,664 to Levy (see col. 5, lines 3-11).

With respect to the rejection of Claims 4-11 lacking proper antecedent basis for the limitation “the inertial force,” the dependency of these claims has been changed from direct dependence from Claim 1 to dependence on Claim 3. Claim 3 states “spin of the submunition grenade causes an inertial force to be applied to the firing pin, . . .” [Emphasis added].

Finally, Claim 13 has been cancelled from the present application.

Applicants believe that all the 112 rejections have been overcome in this response. Reconsideration and withdrawal of the same is respectfully requested.

102 Rejections:

Claims 1-2 and 4-6 have been initially rejected under 102(b) as anticipated by U.S. Patent No. 4,811,664 to Levy (hereafter “Levy”). Applicants respectfully traverse this rejection.

As background, a serious consideration with submunition grenades that are packed in cargo projectiles is that the grenades must be unarmed initially and then armed at an appropriate time. Further, when armed, the grenades should not be in a “safe” mode of any sort which may prevent them from exploding, leaving “duds” on the battlefield.

It is clearly dangerous to transport or otherwise move armed grenade warheads. In fact, it is considered dangerous to arm such warheads at any time prior to launch. However, prior art warheads require such arming to allow for detonation to occur. Similarly, it is a safety hazard to civilians and friendly troops to have armed, non-detonated warheads (i.e., duds) left on the battlefield after a battle. Such “duds” are notoriously unstable.

The present invention provides a fuse mechanism designed to allow the warhead to be unarmed right up to the time of ejection of the munitions—this avoids the safety hazards associated with transferring or movement of armed warheads. At the same time, however, the

fuse mechanism automatically arms the warhead upon ejection or shortly thereafter.

Additionally, it can occur that the submunition grenade never becomes armed and, therefore, will not explode on impact. However, the swivel mounted striker 34 (Figs. 7A and 7B) will still swivel around its pivot 36 into position such that it strikes the percussion cap 40 and activates the time delay detonator ignition system 32. This ignites the pyrotechnic combustion charge 38, which will burn through to destroy the stab detonator 28 in the safe position. This is accomplished without reliance on stored energy components of any kind (e.g., electrical, mechanical, and chemical) and effectively neutralizes the warhead (see page 14 of present application).

Accordingly, Claim 1 requires “a time delay detonator ignition system for delayed ignition of the stab detonator and a spin activated swivel mounted striker for activating the time delay detonator ignition system, . . .” and “a fully mechanical inertial releasable safety apparatus . . . to prevent initiation of said time delay detonator ignition system.”

Conversely, Levy is directed to a fuse having a delayed action ignition means 16 which serves as a backup for the normal impact ignition of the detonator in the event of a “soft” landing or a malfunction of the striker pin assembly. The ignition means of Levy causes the ordnance to detonate. Levy does not disclose a “self neutralizing mode” provided by a time delay detonator ignition system, as required by Claim 1.

Claim 1, therefore, distinguishes over the cited reference. Applicants believe Claim 1 is in condition for allowance and respectfully request reconsideration and withdrawal of the Examiner’s rejection. The remaining claims depend from Claim 1, adding limitations to the base claim, and should also be considered to be in condition for allowance.

103 Rejections:

Claims 1, 3 and 7 have been rejected under 103(a) as unpatentable over Levy in view of U.S. Patent No. 4,848,235 to Postler (hereafter "Postler"). Claims 8/1-2, 8/4-6, 9 and 10 are currently rejected under 103(a) as unpatentable over Levy alone. Claims 11/1-2 and 11/4-6 stand rejected under 103(a) as unpatentable over Levy in view of U.S. Patent No. 5,275,101 to Chemiere (hereafter "Chemiere"). Applicants respectfully traverse these rejections.

As stated above, Claims 2-12 depend from independent Claim 1, adding further limitations to the base claim. The present rejections depend on the Action's contention that Levy discloses all the elements of Claim 1, which it clearly does not. Further, neither Postler nor Chemiere supply the missing element of Claim 1 in order to support a proper rejection under 35 U.S.C. 103(a). Accordingly, Claim 1 distinguishes over the cited references and any further rejection of this claim under 102(b) or 103(a) would be improper.

As Claims 2-12 depend from Claim 1, these claims too should be considered to distinguish over the cited references. All claims are, therefore, considered to be in condition for allowance.

CONCLUSION

The present application was originally filed with Claims 1-13. Claim 13 has been cancelled in this reply, leaving Claims 1-12 pending and at issue. Of the remaining claims, Claims 1, 4-7 and 12 have been amended. Claims 1-12 stand rejected under at least one of either 35 U.S.C. 102(b), 103(a) and 112, first and second paragraphs. Several of such remaining claims also have been objected to for informal matters. Applicants respectfully traverse these rejections and request reconsideration of all claims in light of the amendments and arguments above.

The specification and drawing FIG. 2A have also been amended to address objections in the current Action. Applicants believe these amendments overcome the objections and accordingly request withdrawal of the same.

Should any additional informalities remain which may be handled by Examiner's amendment, Applicants request that the undersigned be contacted in order to expedite the prosecution of the present application.

Respectfully submitted,

By 

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